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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,024	03/26/2004	Zhaofu Hu		8420

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EXAMINER

SANTIAGO, MARICELI

ART UNIT PAPER NUMBER

2879

DATE MAILED: 05/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/810,024

Applicant(s)

HU ET AL.

Examiner

Mariceli Santiago

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-17 is/are allowed.
- 6) ☒ Claim(s) 1-6, 12 and 13 is/are rejected.
- 7) ☒ Claim(s) 7-11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/26/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

The Amendment, filed on February 22, 2006, has been entered and acknowledged by the Examiner.

Cancellation of claim 18 has been entered.

Claims 1-17 are pending in the instant application.

### ***Election/Restrictions***

Applicant's election without traverse of Group I, claims 1-17 in the reply filed on February 22, 2006 is acknowledged.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 5, 6, 12 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakamoto et al. (US 2005/0122030).

Regarding claim 1, Sakamoto discloses a method for making a field emission display (Fig. 13) comprising the following steps providing a substrate (128), forming cathode electrodes (142) on the substrate, the cathode electrodes together with the substrate defining a pixel pattern, forming a barrier array (150), forming gate electrodes (144) on the barrier array, fixing

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the barrier array with the gate electrodes to the substrate, and packaging a phosphor screen (136) with the substrate, wherein the barrier array is formed (refer to Fig. 4) by depositing an insulative layer (42) on a shadow mask (32) which defines a plurality of openings according to the pixel pattern of the field emission display (Fig. 7).

Regarding claim 3, Sakamoto discloses a method wherein the method further comprises the step of providing a mask having a pattern according to the pixel pattern (Figs. 4 and 7).

Regarding claim 5, Sakamoto discloses a method wherein the insulative layer comprises alumina.

Regarding claim 6, Sakamoto discloses a method wherein a thickness of the insulative layer is in the range from 10 to 500 micrometers (Paragraph [180]).

Regarding claim 12, Sakamoto discloses a method wherein the barrier array with the gate electrodes formed thereon is fixed to the substrate by means selected from fusing powdered glass having a low melting point (glass frit, paragraph [211]).

Regarding claim 13, Sakamoto discloses a method wherein emitters employed by the field emission display comprise carbon nanotubes or metal microtips (Paragraph [0193]).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. (US 2005/0122030).

Regarding claim 2, Sakamoto discloses a substrate made of glass, ceramic, silicon oxide, alumina or another suitable insulative material, however, fails to exemplify the limitation of having a surface with a total thickness variation less than 1 micrometer. At the time the invention was made, it would have been an obvious matter of design engineering to a person of ordinary skill in the art to provide a surface with a total thickness variation less than 1 micrometer since applicant's claimed thickness variation does not solve any of the stated problems or yield any unexpected result that is not within the scope of the teaching applied. Furthermore, one skilled in the art would reasonable expect applicant's invention to perform equally well with either the substrate disclosed by Sakamoto or the claimed substrate surface with a total thickness variation less than 1 micrometer since both substrate perform the same function of supporting the components of the field emission display. Accordingly, it would have been an obvious matter of design engineering to modify the device of Sakamoto to obtain the invention as specified in claim 2.

Regarding claim 4, Sakamoto fails to exemplify the limitation of the shadow mask is made from a material selected from the group of invar, low carbon steel, or another suitable metal alloy, and the material has a coefficient of thermal expansion matching that of the substrate. It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Moreover, applicant's claimed shadow mask material does not solve any of the stated problems or yield any unexpected result that is not within the scope of the teaching applied. One skilled in the art would reasonable expect applicant's invention to perform equally well with either the shadow mask disclosed by Sakamoto or the claimed shadow mask materials since both structure perform the same function of providing a pattern for the deposition of the insulative layer. Accordingly, it would have been an obvious matter of design engineering to modify the device of Sakamoto to obtain the invention as specified in claim 4.

***Allowable Subject Matter***

Claims 14-17 are allowed over the prior art of record.

Claims 7-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 7-9, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claims 7-9, and specifically comprising the limitation of the insulative layer is formed on the shadow mask by spray coating, or alternatively, by electrophoretic deposition.

Regarding claim 10, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 10, and specifically comprising the limitation of the gate electrodes are formed on the barrier array by electron beam evaporation, thermal evaporation or sputtering.

Regarding claim 11, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 11, and specifically comprising the limitation of a step of attaching the barrier array to a frame having a fixing surface.

Regarding claim 14, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 14, and specifically comprising the limitation of providing a metal plate defining a plurality of openings according to the pixel pattern with an insulative layer formed thereon, forming gate electrodes on the insulative layer, fixing the metal plate with the insulative layer formed thereon to the substrate.

Regarding claims 15-17, claims 15-17 are allowable for the reasons given in claim 14 because of their dependency status from claim 14.

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***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mariceli Santiago whose telephone number is (571) 272-2464. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Mariceli Santiago  
Primary Examiner  
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